

**MARYLAND HISTORICAL TRUST
DETERMINATION OF ELIGIBILITY FORM**

NR Eligible: yes ☐
no ☒

Property Name: APG, Building E7821, Building E7822, and Antenna Inventory Number: BA-3247

Address: Graces Quarters Historic district: ☐ yes ☒ no

City: Chase Zip Code: 21120 County: Baltimore County

USGS Quadrangle(s): Gunpowder Neck

Property Owner: Aberdeen Proving Ground Tax Account ID Number: N/A

Tax Map Parcel Number(s): N/A Tax Map Number: N/A

Project: _____ Agency: _____

Agency Prepared By: R. Christopher Goodwin & Associates, Inc

Preparer's Name: Katherine Grandine Date Prepared: 12/18/2009

Documentation is presented in: _____

Preparer's Eligibility Recommendation: ☒ Eligibility recommended ☐ Eligibility not recommended

Criteria: ☒ A ☒ B ☒ C ☐ D Considerations: ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☒ G

Complete if the property is a contributing or non-contributing resource to a NR district/property:

Name of the District/Property: _____

Inventory Number: _____ Eligible: ☐ yes ☐ no Listed: ☐ yes ☐ no

Site visit by MHT Staff ☒ yes ☐ no Name: Amanda Apple Date: 06/2009

Description of Property and Justification: *(Please attach map and photo)*

Buildings E7821, E7822, and associated antenna were constructed in 1972 in the Graces Quarters area of Aberdeen Proving Ground, Maryland. These structures comprise a transmitter station constructed as one component of the Decision Information Distribution System (DIDS). This low-frequency radio network was designed by the Office of Civil Defense in the Department of the Army during the late 1960s to supplement existing broadcast warning systems to deliver warnings to state and local governments, institutions, and individual homes in the event of enemy nuclear attack. DIDS was planned to be implemented nationwide, but only the single transmitter station at Edgewood Arsenal was constructed by 1976. Though implementation of DIDS was planned during the 1970s, federal policy changes that redefined civil defense to include not only defense against nuclear attack, but also natural disasters and other emergencies, led to the creation of the civilian-led Federal Emergency Management Agency (FEMA) in 1979. Other publically developed warning systems, such as the National Warning System (NAWAS), the Emergency Broadcast System (EBS), and the NOAA Weather Radio Service that were developed concurrently with DIDS, were adopted as the primary systems for disseminating information to the public during natural disasters and/or enemy attack scenarios. Interest in further implementation of DIDS was terminated.

Methods

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Eligibility recommended ☒ Eligibility not recommended ☐

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MHT Comments:

Amanda Apple
Reviewer, Office of Preservation Services

1/14/10
Date

[Signature]
Reviewer, National Register Program

1/14/10
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Limited information on the buildings and DIDS system were available. Building-specific information was collected from real property records and drawings available at the Directorate of Public Works (DPW) at Aberdeen Proving Ground (APG). A few technical equipment manuals were collected from the file cabinets in Building E7821.

Research conducted on the internet yielded few references to government documents, technical reports, and general references. A single article about DIDS written by a radio enthusiast Bennett Z. Kobb in 1990, with later annotations, also was located on the internet (Kobb 1990). Efforts to check references in Kobb's article led R. Christopher Goodwin & Associates (RCGA), Inc. staff to try to locate the library formerly associated with the FEMA, now part of the Department of Homeland Security. RCGA, Inc. was informed that FEMA's library collection was moved to Lanham, but no additional information about the exact location of the library, its contents, or public access was available.

The Library of Congress holdings yielded several technical reports prepared during the development and early implementation for DIDS. These technical reports were approved for unlimited public distribution at the time of their issue. No classified or formerly classified materials were identified or used in the preparation of this report.

RCGA, Inc. contacted the library of the National Electronics Museum. The core collection of the library is materials from the Westinghouse Corporation. The library holdings are focused on technology and equipment. A search of the collection located no information on DIDS or the Department of Civil Preparedness Agency (Ballard 10/19/2009).

Description

The complex comprising the transformer building (E7821), the antenna coupler building (E7822), and the antenna, is sited on Graces Quarters, in an area formerly associated with the testing programs of Edgewood Arsenal. Graces Quarters is in Baltimore County, separated from the main Edgewood Arsenal by the mouth of the Gunpowder River. The closest community is Chase, Maryland. The main building is accessed by a roadway that ends in a small parking lot. A walkway with short flights of concrete steps ascends a mound to an above-ground weather shelter. The mound formerly was a mowed grassy area, but is currently covered with second-growth bushes, vines, and small trees.

Drawings for the complex dated December 1971 were prepared for the Office of Civil Defense, Department of the Army by Westinghouse Electric Corporation, Systems Development Division, Baltimore, Maryland, in association with Parsons, Brinckerhoff, Quade & Douglas, Inc., New York City, New York (APG DPW, Drawings 031006, 031008, 031009, 031017, 030972, 1971). The actual designs for the structures were completed by Parsons, Brinckerhoff, Quade & Douglas, Inc. Westinghouse Electric Corporation provided all of the equipment and served as the contractor. The U.S. Army Communications Command accepted the project as complete on 21 June 1974 (APG, DPW, Real Property records).

The transformer building (Building E7821) is an earth-covered rectangular building that measures 79 x 42 ft. The walls are constructed of thick reinforced concrete. The roof is comprised of a thick reinforced concrete slab, and the floor slab appears to be slightly thicker (APG, DPW Drawing 031009). The drawings and a ca. 1971 photograph suggest that the concrete foundation, walls, and roof were poured in place. The equipment was then installed through an equipment hatch measuring 6' x 12' in the roof over Room 103; the hatch was sealed with concrete. The last step in the construction was to mound fill dirt over the structure (APG, DPW Drawings 031006, 031009; SciTech 1997:E7821-4; APG DPW, Real Property records).

Elements visible above ground include the upper level of the enclosed stairwell, an above-ground weather shelter, a variety of metal vents, and a square concrete shaft. The exposed exterior wall of the stairwell is concrete. The words "R (possible letters missing) -/Station WGU 20" and "E7821" are stenciled on the exposed concrete wall. This wall contains the doorway into the

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structure. An above-ground weather shelter that shelters the doorway is constructed with two walls of glazed structural clay tile. The vestibule has an arched roof made from a 66" half-round corrugated aluminum culvert. A tubular metal intake shaft with a curved top is located near the weather shelter. A three-foot square concrete intake shaft with a metal grate is placed over the filter in the mechanical parts storage room (Room 104). Air taken in through this vent was filtered and distributed by fans to the underground rooms (APG, DPW drawing 031009; SciTech 1997:E7821-2; U.S. Army Research Development and Engineering Command (RDECOM) building vertical files).

Entry to the upper landing of the stairwell is through a heavy metal door that features a large metal latch and robust exterior hinges. The FEMA logo is applied to the door. Two flights of concrete steps joined by an intermediate landing descend to the main floor. The stairs are constructed of reinforced concrete with steel pipe railings. The walls of the stairway are concrete; the walls exhibit the imprint of plywood graining. At the base of the stairwell is a sliding metal fire door.

The underground building contains 10 rooms. The southern half of the building contains the bunk room (Room 110), the dining room (Room 107), a two-stall toilet with shower, the utility room (Room 108), a short hall (Room 105), a shielded room (Room 106), and the transmitter room (Room 101). The northern half of the building contains the filter and mechanical parts storage room (Room 105), a storage and shop area (Room 103), the generator room (Room 102), and a fuel tank storage room (Room 100). The two halves of the building are divided by a thick reinforced concrete wall sheathed in acoustic wall finish. The ceilings are 11 ft high (APG DPW, Drawings 031008, 031009; SciTech 1997:E7821-4). The outer walls are finished in Electro Magnetic Pulse (EMP) shielding that appears as painted metal paneling (probably lead) (SciTech 1997:E7821-3).

The transmitter room (Room 101) is outfitted with two rows of transmitters. One row of transmitters is placed along the interior wall of the room, while a second row is placed approximately 2' away from the exterior wall. All transmitters are placed on heavy duty industrial coiled springs to counteract the effects of blast shocks.

The generator room (Room 102) contains two Atlantic Engine Power diesel generators (model number 150soqd, type 16626) rated 170 kW, 120/208 volts, 60 Hz, 3PH, 4 wire at 1,200 rpm. The generators were manufactured by the Alban Tractor Company of Elkridge, Maryland. The generators and supporting equipment were also supported on heavy, industrial coil springs (APG, equipment manual from Building E7821). Commercial elected power was also available to the structure. The generator room also contained the air filtering and handling system. An exhaust plenum attached to the above ground concrete shaft is located in a corner of the generator room (SciTech 1997:E7821-2). In addition, two Emglo air compressors are stacked in the generator room. The compressors were manufactured by Products Corporation of Johnstown, Pennsylvania.

Both the transmitter and the generator rooms were accessed by EMP sliding doors. Each door operated with automatic pneumatic controls. The doors were manufactured by Ray Proof Corporation of Norwalk, Connecticut. The company advertized itself as experts in radio frequency shielding, x-ray protection, and gamma shielding (APG, door manual from Building E7821).

The fuel tank storage room contained two, steel oil tanks, each containing 3,000 gallons of fuel. Access to the fuel tank storage room was by a square opening placed 6' above the floor and accessed by a mounted vertical metal ladder (SciTech 1997:E7821-3).

The employee area had a bunk room, a two-stall bathroom with shower, a dining room, and a kitchenette. The kitchenette had a built in unit that contained a three-burner electric stove, a small oven, a sink, and a small refrigerator. Two metal cabinets were bolted to wall above the stove and sink.

Water was provided through wells. Sump pumps were provided to remove excess water from the floor. Sewage and excess water

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was removed to a 3,000 gallon septic holding tank and then released into a settling pond. Fire prevention was provided by a CO2 fire extinguishing system (SciTech 1997:E7821-2,3).

The antenna coupler building (Building E7822) is located at the base of the antenna. The antenna coupler building is a cube that measures 8' x 10'. The cube is constructed of reinforced concrete approximately 10" thick. The walls of the cube are lined with E.M.P. Keystone shielding. The underground concrete cube is accessed by a hardwood ladder from a corner of the above-ground weather shelter. The weather shelter measures approximately 3' x 3' and is constructed of glazed tile. A freestanding glazed tile wall is set approximately 3'-8" away from the weather shelter. The above-ground structure is roofed with a thick flat reinforced concrete slab. The weather shelter has a single entry located in the wall opposite the freestanding wall. All other walls of the weather shelter are blind (APG DPW Drawing 031017, 1971).

The antenna, reported as 700 feet in height, is formed of triangular metal forms bolted together to form a cage. The tower is supported by guy wires. The transmitter building was linked to the antenna by a 750-foot dual underground RF transmission line (APG, DPW real property records DD Form 1354 21 June 1974).

Historic Context

Buildings E7821, E7822, and the antenna were constructed as a distribution transmitter station, one component of DIDS. DIDS was developed during the late 1960s by the Office of Civil Defense in the Department of the Army for the sole purpose of delivering warnings to the public in the event of an enemy nuclear attack. The system used low-frequency radio waves, which were considered unaffected by changes in the atmosphere and had a long range. DIDS was engineered to address perceived shortcomings in the concurrent warning systems, such as the EBS under the FCC, NAWAS under the DoD, and NOAA's Weather Radio Service. Although DIDS was planned to be implemented nationwide, only the single transmitter station at Edgewood Arsenal was constructed by 1976. Just as the prototype DIDS distribution transmitter station was becoming operational at Edgewood Arsenal, changes in federal policy implemented during the decade of the 1970s curtailed the overall mission of DIDS and affected its future. In 1972, federal policy radically redefined civil defense to include not only defense against nuclear attack but also natural disasters and other emergencies. This concept gained support among the leaders in Congress and the Carter White House and led to the creation of the civilian-led FEMA in 1979. Under FEMA, funding was directed to the already existing widespread warning systems that could function in all types of emergency conditions, and interest in further implementation of DIDS was terminated.

Civil defense in the U.S. grew out of the experiences of World War II. Civil defense planners remembered the striking vision of Europeans, especially British civilians, hearing external warning sirens and heading to shelters for protection against enemy air attacks. The U.S. had no nationwide system to broadcast emergency warnings to citizens, but existing radio stations and networks could interrupt broadcasting programs to issue emergency bulletins, as happened after the bombing of Pearl Harbor on 7 December 1941. By the beginning of the 1950s, the real threat of nuclear bombs delivered by enemy aircraft resulted in the passage of the Federal Civil Defense Act of 1950 and the establishment of the Federal Civil Defense Administration (1950-1958). By 1961, civil defense activities were located within the Department of Defense (DoD), and between 1961 and 1964, the Office of Civil Defense was under the DoD. Between 1964 and 1972, the Office of Civil Defense was under the Department of the Army. Between 1972 and 1979, the Defense Civil Preparedness Agency within the DoD handled civil defense matters (NARA RG 397).

Throughout the 1960s, civil defense was defined as protecting the civilian population in the event of a nuclear attack. This was a decade of heightened awareness of the potential of enemy attack by air, especially from the Soviet Union. In 1965, the responsibilities assigned to the Director of Civil Defense in the Department of the Army were "formulation, development, execution, and administration of the civil defense program," which included:

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- a. Fallout shelter program;
- b. Civilian chemical, biological, and radiological warfare defense program;
- c. Civil defense warning, alerting, and communications;
- d. Emergency assistance to State and local governments in a post-attack period;
- e. Protection and emergency operational capability of State and local governments;
- f. Financial assistance and donation of Federal surplus property to States for civil defense purposes;
- g. Post-attack damage assessment;
- h. Civil defense research and development;
- i. Civil defense training, education, public information, and industrial participation; and,
- j. Advising the Secretary of the Army on policy and program aspects of military support of civil defense" (Department of the Army General Orders No. 22 1965:3).

One of the stated goals of the Office of Civil Defense was to develop and to implement "all steps necessary to warn or alert Federal military and civilian authorities, State officials, and the civilian population of an enemy attack on the United States" (FCC 1967:11). During the 1960s and 1970s, the Office of Civil Defense expanded NAWAS, which was begun during the 1950s (National Warning System 1998). NAWAS is a special purpose telephone voice communication system implemented by the Office of Civil Defense to provide warnings of an enemy attack to federal, state, and local officials. Local populations were alerted by state and local authorities through outdoor warning devices, such as sirens or bells (FCC 1967:11; Kobb 1990). By 1972, NAWAS was described with the capabilities of broadcasting almost instantaneous attack warnings from three continuously manned national warning centers; the three centers were located in Cheyenne Mountain, Colorado Springs, Colorado; Denton, Texas; and, Washington, D.C. The system reached "297 warning points" at federal installations throughout the U.S. and "870 state and local warning points" (DCPA 1972a:7). NAWAS was successfully deployed during 1972 to deliver tornado warnings in six states, a blizzard warning in Nebraska, and flood warnings among states affected by Hurricane Agnes (Bell 1972:27). By 1976, NAWAS had approximately 2,200 operational points, as well as connections to additional governmental and non-governmental communications facilities (Rosenthal et al. 1976:1).

However, the Office of Civil Defense in the Department of the Army wanted to develop a public notification system that would withstand nuclear attack, be equipped with backup circuitry, and be highly automated to avoid the potential for human error. In 1967, the Office of Civil Defense laid out its requirements for "rapid dissemination of attack warning messages to the broadcast industry so the industry can assist in advising the public immediately of attack warning simultaneously with the sounding of alerting messages" (FCC 1967:11). While encouraging the use of existing warning systems, notably the FCC's EBS, the Office of Civil Defense wanted to develop a new system that was "capable of surviving to the maximum possible extent required to maintain essential communications under nuclear attack conditions. This means that single or multiple equipment or circuit failures or losses will not cause significant stoppage of the systems' ability to function as a whole or in segments on a regional, State, or operational area basis. One way to provide this reliability is by circuit and facility redundancy" (FCC 1967:12). The Office of Civil Defense proposed to fund development and construction of selected broadcast stations that met the following requirements: "(1) austere radiological fallout protection facilities for minimum operating personnel, (2) auxiliary electrical power generation equipment, and (3) reliable communications systems and related programming equipment necessary for program origination at appropriate civil defense emergency operating centers" (FCC 1967:12).

DIDS was designed to meet these requirements. DIDS was described as a "low-frequency radio network...designed to improve and expand nationwide warning...DIDS could form the basis for automatic indoor home warning" through activating specially designed home warning receivers purchased by citizens or incorporated into radios and televisions (DCPA 1972a:8; DCPA 1972:7). Low frequency radio waves, such as the 61kHz selected for DIDS, were chosen because low frequency radio signals follow the curvature of the earth, travel a far distance, and are less subject to absorption by the atmosphere. Although low-

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frequency radio waves had advantages, receivers for low-frequency transmissions in the U.S. were few in number and not readily available to the general public during the late 1960s and early 1970s.

Development of DIDS occurred during the late 1960s. System Development Corporation published several reports between 1967 and 1974 describing DIDS and specifications for its operational requirements (System Development Corporation 1967, 1968, 1974). System Development Corporation provided expertise in the design of large, complex, computer-controlled systems for the DoD (System Development Corporation 2009). The distribution transmitter station of DIDS was designed to be either entirely automated or semi-automated. Messages were to be broadcast using "a binary, nonchorent, frequency-shift-keying, multiple-message, one-shot, radio transmission" (Akima 1974:2-3).

As planned, DIDS would be activated from three warning centers (Colorado Springs, Colorado; Denton, Texas; and Virginia), two of which were also part of NAWAS. In fact, the warning center in Colorado was tied directly to the U.S. Air Force's North American Aerospace Defense Command (NORAD), the first group that would detect incoming enemy aircraft. Any warning received from the three warning centers would be forwarded by both wire line networks (AT&T and Autovon) and low-frequency radio waves to the two DIDS control stations, which would then transmit the warning to the 10 distribution stations. From the distribution stations, the signal was sent by low-frequency radio waves to receivers that could activate voice messages, printers, or outdoor sirens (DCPA 1972a:55). The control stations were planned to operate at 61.15 kHz with 1,260-foot towers broadcasting at 200 kW. The control stations were planned to be located at Ault, Colorado, and Cambridge, Kansas. The ten distribution stations were designed to operate 50 kW at 167, 179, and 191 kHz with 700-foot towers. Locations proposed for the distribution stations were Edgewood Arsenal, Maryland (i.e., the subject of this DOE); Maynard, Massachusetts; Mount Joy, Pennsylvania; Gray, Maine; Morristown, Tennessee; Starke or Chiefland, Florida; Mazomanie, Wisconsin; Carthage, Marshal, or Seagoville, Texas; Alcova or Riverton, Wyoming; Mendota or Selma, California; Winslow, Arizona; Hermiston, Oregon; and, Wallula, Washington (Kobb 1990). The system was planned to reach all 48 contiguous states; Alaska and Hawaii were to be equipped with separate systems.

One advantage of DIDS was automation that eliminated the potential for human error, delays, and jamming interference (i.e., spoofing). The system was planned to automatically switch on warning sirens and wake citizens up in their homes through the use of stand-alone home warning devices or low-frequency radio receivers implanted in televisions and radios that activated even if the set was turned off. DIDS was marketed to the public under the name of Public Emergency Radio (PER) with a logo of a puppy named "PERKI" waking his family to get them to safety (Kobb 1990).

In 1971, drawings for the prototype DIDS transmitter facility were prepared (APG DPW drawings). Unoccupied land at the edge of Edgewood Arsenal was selected for construction of the prototype. This area was on a secure military installation and surrounded by open land. Though relatively close to Washington, D.C., the location was not close enough to be a primary first target of enemy aircraft. Construction of the prototype occurred during 1972 (Bell 1972:27). As described in 1972, "A contract was let and construction is in progress on the first of 10 transmission facilities. This prototype facility is located at Edgewood Arsenal, Md. It will serve a 10-State area from Virginia to Massachusetts, and will be "on-the-air" early in 1973 for test and evaluation purposes" (DCPA 1972a:8; DCPA 1972:7).

On 5 May 1972, in the middle of the construction of the DIDS prototype at Edgewood Arsenal, the Office of Civil Defense in the Department of the Army was abolished and all functions were transferred to the Defense Civil Preparedness Agency (DCPA) under the DoD (Bell 1972:27; DCPA 1972:v). This change resulted from efforts to refocus civil defense efforts to include not only enemy attacks (nuclear and otherwise) but also natural disaster scenarios and other emergencies. The term "civil defense" was being replaced by "civil preparedness" (DCPA 1972a:1). This change in focus became law in 1974, when the Robert T. Stafford Disaster Relief and Emergency Assistance Act authorized the President of the U.S. to use the Civil Defense Warning System, i.e.,

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NAWAS, to deliver warnings to the public of disaster conditions, other than enemy attack (Governor's Office n.d.). DCPA was assigned the role of "development and operation of civil preparedness warning or alerting, and communications systems; (and) a system for warning affected Federal activities, State and local governments, and the civilian population of impending disasters" (DCPA 1972a:2). DCPA had oversight of the federal portion of the warning system, which comprised NAWAS and DIDS. State and local governments were responsible for transmitting information received from NAWAS and broadcasting that information to local populations (DCPA 1972a:8).

By June 1974, the DIDS transmitter complex at Edgewood Arsenal was complete and the contractor was close to turning over the facilities to the government. Discussions occurred among the U.S. Army Communications Command (USACC) in Fort Huachuca, Arizona, Aberdeen Proving Ground in Maryland, Army Headquarters, the Army Materiel Command (AMC), and the Chief of Engineers during April and May 1974 on the topic of which organization was responsible for reporting the complex on their real property records and for overall maintenance. The APG Director, Facilities Engineering Directorate, acquiesced to the transfer and acceptance of the DIDS complex into the real property records at APG, but stated that APG lacked in-house ability to provide operational support or maintenance for the complex. In addition, APG advised that the area was contaminated and assigned the licensee the responsibility of preventing unauthorized or unsupervised personnel entry into the area (APG, DPW real property records memorandum subject: DIDS-CD Prototype Real Property Management, Graces Quarters, MD, 1 May 1974).

On 17 May 1974, representatives of the DIDS program from the Pentagon, Arlington, Virginia; Headquarters AMC, Alexandria, Virginia; Aberdeen Proving Ground, Maryland; and, USACC, Fort Ritchie, Maryland, met and accepted the DIDS transmitter equipment and facilities near Chase, Maryland. The antenna and coupler building (Building E7822) cost \$993,000 and the earth-covered bunker (Building E7821) cost \$1,863,000 (APG, DPW real property records). The transmitter station was linked to the communications monitoring and control console at the Federal Regional Center (FRC), Olney, Maryland, and receivers in the ten states covered by the transmitter. The sum total of the DIDS components constructed at that time was valued at \$5,431,000 and was accepted by USACC from the contractor Westinghouse Corporation (Aerospace Division). APG agreed to contract all site support services, after USACC agreed to provide funding. A contracted guard at the gate was scheduled to take up his post at 5pm on 14 May 1974 (APG, DPW real property records memorandum subject: Acceptance of DIDS/Maryland Transmitter System 17 May 1974). In addition to the guard at the gate, additional security measures were also implemented (Ballard 2009). Operating personnel were scheduled to begin work at the facility at 8 am on 15 May 1974 (APG, DPW real property records memorandum subject: Acceptance of DIDS/Maryland Transmitter System 17 May 1974). Maximum occupancy of Building E7821 was 6 persons funded by USACC per an intraservice agreement effective from 1 October 1974 until 30 September 1979 (APG, DPW real property records Intraservice Support Agreement April 1975).

The report on the May 1974 meeting at Edgewood Arsenal contained information about future expansion plans for DIDS. The AMC representative inquired about the status of plans to construct DIDS installations on two AMC installations. These installations were located near Natick, Massachusetts, and in Kansas (APG, DPW real property records memorandum subject: Acceptance of DIDS/Maryland Transmitter System 17 May 1974). No documentation suggests that other DIDS stations were constructed.

In 1976, a study was published that evaluated the ability to deliver attack warnings through DIDS, NAWAS, the NOAA Weather Radio, and various combinations of these three systems based on selected criteria of reliability, security, survivability, flexibility, response time, coverage, and cost. The study ranked DIDS as the most effective of the existing systems and included a description of the system as implemented to date. The DIDS operational components in 1976 comprised one control console and status display installed in the National Warning Center Three (NWC3) at Olney, Maryland; the distribution system transmitter located at Edgewood Arsenal; and, approximately 400 receivers (out of 500 available) deployed to organizations and institutions within the coverage area of the Edgewood transmitter. Plans to develop 1,000 additional receivers were reported as underway. NWC3 was

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linked with the Edgewood Arsenal transmitter by dedicated telephone lines, Autovon line, and radio based communication. Future improvements proposed between NWC3 and the transmitter at Edgewood Arsenal comprised EMP protected, hardened microwave and cable links (Rosenthal et al. 1976:4-1, 4-2, 4-3).

The plan for implementation of DIDS in 1981 was redesigned. Separate control stations to activate DIDS were eliminated. The 1981 plan was to co-locate the two DIDS control stations with existing warning centers, one at the National Warning Center in Colorado Springs, Colorado, and one at the National Warning Center Three in Olney, Maryland. Ten distribution transmitters were planned, but no locations were identified in the report (Rosenthal et al. 1976:4-2). By 1976, one National Warning Center and the two control stations planned in 1972 were eliminated. The system was to be activated directly from the two National Warning Centers.

The operation of the distribution transmitter, such as the one constructed at Edgewood Arsenal, was described as follows: "Each transmitter will operate on one of 10 frequencies between 163 and 197 kHz. In addition to a transmitter, each distribution facility includes the equipment necessary to respond to commands generated by the control consoles, to report to the status displays, and to perform other functions such as failure detection, automatic switchover to standby components, and emergency power generation. Upon receipt of the appropriate commands from the control subsystem, the distribution subsystem is designed to activate one or more distribution transmitters, transmit digital codes that demute receivers and/or actuate sirens, transmit a message (with or without alert signal) including necessary repeats, remute receivers and/or turn off sirens, and return the transmitter or transmitters to standby status" (Rosenthal et al. 1976:4-2).

The transmitter was designed to operate in automatic and semi-automatic modes. The automatic mode allowed for rapid transmission of an attack warning, while the semi-automatic mode allowed for the transmission of any type of information. The response time from the NWC through DIDS to selected receivers was 30 seconds; a four-minute response time was anticipated if DIDS notified the public through radio and television stations. The transmitter was fully automatic and controlled from the off-site control console. In the case of the transmitter located at Edgewood Arsenal, all controls came from NWC3 at Olney, Maryland. Each transmitter was designed to transmit up to 2,048 address codes, organized by geography and organization (Rosenthal et al. 1976:4-6, 4-8).

While the authors of the 1976 report admitted that operational experience with the distribution transmitter at Edgewood Arsenal was not available, the system was designed for survivability and reliability. The control and the distribution transmitters were designed to be tested every three hours and the entire system was tested once every day (Rosenthal et al. 1976:4-3). The transmitter buildings were designed to survive ground shocks, and the antenna was designed to withstand an overpressure of 5 psi under conditions of wind and ice loading expected at the site. In addition, the transmitter building, as designed, could sustain a crew of six people for up to two weeks, and could store enough fuel to operate the transmitter and ancillary equipment continuously during that period. Moreover, the building, as designed, could protect personnel occupying the structure to a degree by shielding them from prompt radiation exposure, shocks and overpressure. (Rosenthal et al. 1976).

Although DIDS originally was planned to incorporate home warning devices, that component was dropped from the program due to a change in federal policy dated 13 January 1975. The policy issued by the Office of the President entitled "National Policy for the Use of Telecommunications to Warn the Public" stated that the only home warning system backed by the federal government was NOAA's National Weather Service VHF/FM Tone Alert System. NOAA's system was found to be the best suited to serve as a single national home warning system. The reasons given for this finding were that NOAA's system already provided daily weather service, was more extensive than DIDS, and was cheaper to expand (National Weather Service Instruction 10-1711 2009). Even without the home warning component, DCPA planners intended to expand DIDS to include additional organizations and institutions through the placement of 1,000 new receivers then under development and complete the construction of the

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remaining nine distribution transmitters by 1981 (Rosenthal et al. 1976:4-11, 4-3).

No documentation or reports located during the course of this investigation indicate if additional distribution transmitters other than the one at Edgewood Arsenal ever were constructed. At a 1977 hearing on DCPA before the Subcommittee on General Legislation of the Committee on Armed Services, U.S. Senate, Mr. Lea Kungle, President of the U.S. Civil Defense Council, complained about the lack of funding for civil defense measures. Listed among Mr. Kungle's complaints was the statement that DIDS warning system was mothballed (U.S. Senate 1977:4). The 1977 hearing demonstrated confusion over the role of the DCPA and its participation in the broadened role of emergency preparedness in the event of natural disaster or other emergency, such as the power blackout in New York City of that year. The director of DCPA reported to the subcommittee that officials in the White House of the recently elected Carter administration were conducting studies to reorganize the federal response to emergency preparedness (U.S. Senate 1977).

In 1979 by Presidential Order, the duties assigned to DCPA were reassigned to FEMA, and interest in DIDS was terminated over the next few years. Kobb (1990) suggests that FEMA found the system too costly to build and maintain and that the system only broadcast information with no ability to collect data to provide coordination among emergency responders. The costs of DIDS reported in 1976 for the transmitter at Edgewood Arsenal and the console at Olney, Maryland, was \$5.4 million. Costs to build the other nine transmitter stations of the 1981 configuration were estimated at \$3 million each. The total cost to build the facilities was estimated at over \$38 million, while the cost to run the entire program for ten years was estimated to cost \$97.2 million (Rosenthal et al. 1976:4-13, 4-15).

The DIDS transmitter apparently operated automatically for several years. Though carried on the APG real property list, the buildings and the antenna were charged to the USACC until 1979 per an intra-service agreement (APG, DPW real property records Disposition Form and reply 1976, Building Space Assignment 2 April 1979).

Radio enthusiast Bennett Z. Kobb (1990) reported that the transmitter at Edgewood Arsenal broadcast an automated message under the call letters WGU-20. The automated message had the mechanical sound of early speech synthesis with a background of time clicks. The following message ran continuously: Good evening. This is WGU-20, a defense civil preparedness agency station, serving the east central states with emergency information. Eastern Standard Time seventeen hours, twenty minutes, twenty seconds. Good evening. This is WGU-20, a defense civil preparedness agency station, serving the east central states with emergency information. Eastern Standard Time seventeen hours, twenty minutes, twenty-one seconds, etc. (WGU-20 2009). Later, under FEMA, the broadcast was Good evening. This is WGU-20. Eastern Standard Time seventeen hours, twenty minutes, twenty seconds. Good evening. This is WGU-20. Eastern Standard Time seventeen hours, twenty minutes, twenty-one seconds, etc. (Kobb 1990). Radio enthusiasts received the signal from as far away as Massachusetts, North Carolina, and Texas. The station's identification card (QSL card) pictured a silhouette of Paul Revere on horseback, waving his hat, alongside a transmitter tower with the initials DIDS. The card read "QSL Defense Civil Preparedness Agency/Radio Station WGU 20/179 Kiloherz/1st 50 kW/All Solid State AM Transmitter/Chase, Maryland" (Kobb 1990).

The facility was closed in 1988 (Dames and Moore, Inc. 1996; Green 1998; Kobb 1990). In late 1994, the property was released from FEMA to the Army (APG, DPW real property records). In 1997, the facility was assigned to the U.S. Army Directorate of Information Management (DOIM). DOIM maintained the facility until 2007, when the buildings again were released from active use (EA Engineering 2009).

Evaluation

Buildings E7821, E7822, and the antenna are less than 50 years old and were evaluated under National Register Criteria A, B, and

MARYLAND HISTORICAL TRUST REVIEW

Eligibility recommended _____

Eligibility not recommended _____

Criteria: ___ A ___ B ___ C ___ D Considerations: ___ A ___ B ___ C ___ D ___ E ___ F ___ G

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Date

Reviewer, National Register Program

Date

C, and Criteria Consideration G for exceptional importance for those properties less than 50 years of age. Buildings E7821, E7822, and the antenna, constructed in 1972-1973, represent one component of DIDS, a low-frequency radio network designed by the Office of Civil Defense in the Department of the Army during the late 1960s with the sole purpose of delivering warnings to the public in the event of enemy air attack, presumably with nuclear weapons. Although DIDS was planned to be implemented nationwide, only the single transmitter station at Edgewood Arsenal was constructed by 1976. Further development of DIDS was terminated after the system was transferred to FEMA in 1979.

Under the historic context of civil defense, DIDS appears to possess exceptional importance under Criterion A and Criteria Consideration G. The system was engineered by the Office of Civil Defense in the Department of the Army to meet specific criteria of survivability in the event of enemy nuclear attack with a high level of automation to avoid the potential for human error. The design and construction of the complex illustrate the broad patterns of American cultural history during the decade of the 1960s in the Cold War era and embody the U.S. official response to the Cold War and our national preoccupation with nuclear deterrence. While this system is not exceptionally significant for its engineering, this facility is associated with the DIDS which reflects our governmental stance towards civil defense and the appropriateness of alerting the population to incoming nuclear attack (Criterion A).

Buildings E7821, E7822, and the antenna do not appear to possess exceptional significance under Criterion C for architecture or engineering. Building E7821 was constructed as an earth-covered, reinforced concrete box engineered to withstand extreme shock and overpressure, and to protect personnel from extreme radiation exposures. The smaller earth-covered antenna coupler building (Building E7822) met the same engineering specifications. The antenna, which appears to be assembled using a normal type of metal framing supported with guy wires, was engineered to withstand an overpressure of 5 psi from conditions of wind and ice loading anticipated at the site.

Buildings E7821, E7822, and the antenna have no exceptional significance or association in the lives of persons important in our past (Criterion B). During its brief period of operation, it was automated and controlled from a remote location.

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Criteria: ___ A ___ B ___ C ___ D Considerations: ___ A ___ B ___ C ___ D ___ E ___ F ___ G

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NR-ELIGIBILITY REVIEW FORM

BA-3247

APG, Building E7821, Building E7822, and Antenna

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Eligibility recommended _____

Eligibility not recommended _____

Criteria: ___ A ___ B ___ C ___ D Considerations: ___ A ___ B ___ C ___ D ___ E ___ F ___ G

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Date

NR-ELIGIBILITY REVIEW FORM

BA-3247

APG, Building E7821, Building E7822, and Antenna

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Date Prepared:□ 12 November 2009

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Criteria: ___ A ___ B ___ C ___ D Considerations: ___ A ___ B ___ C ___ D ___ E ___ F ___ G

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Date

Maryland Historical Trust

Maryland Inventory of Historic Properties Form

Inventory No. BA-3247

APG, Graces Quarters, Building E7821 (Underground Bunker & Transmitter) and E7822 (Antenna Coupler Building) and Antenna, Baltimore County

Continuation Sheet

Number Photo Log Page 1

The following information is the same for each photograph:

1. MIHP # BA-3247
2. APG, Graces Quarters, Building E7821 (Underground Bunker & Transmitter) and E7822 (Antenna Coupler Building) and Antenna
3. Baltimore County, Maryland
4. APG CRM staff
5. June 2009
6. MD SHPO

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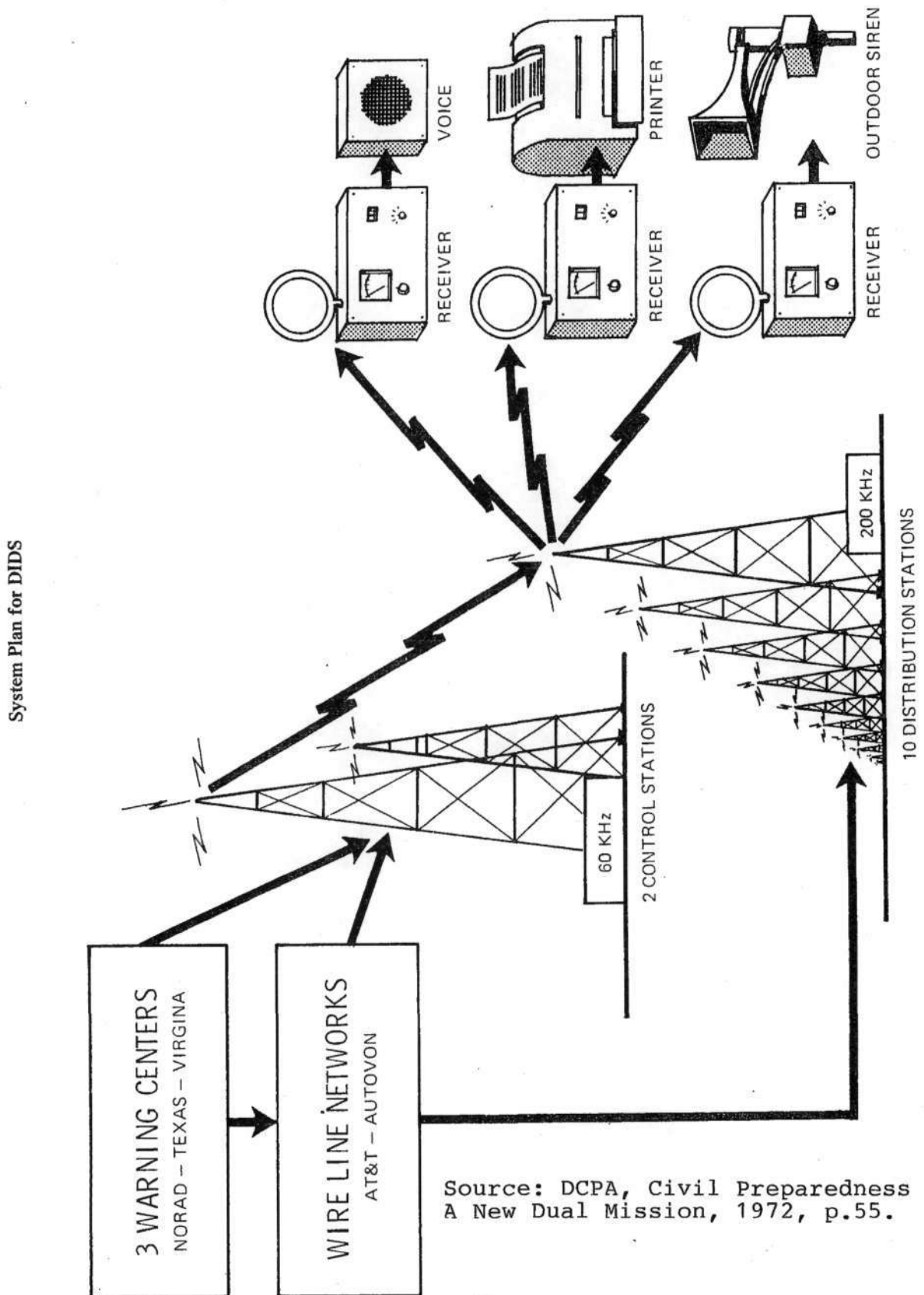
Photo #

BA-3247_2009-06-18_01.tif	Overall view of Building E7821, looking south.
BA-3247_2009-06-18_02.tif	View of above-ground weather shelter of Building E7821, looking south
BA-3247_2009-06-18_03.tif	Metal blast door to Building E7821, looking west
BA-3247_2009-06-18_04.tif	Stairwell descending to Building E7821
BA-3247_2009-06-18_05.tif	Lower entry into Building E7821, looking east
BA-3247_2009-06-18_06.tif	Equipment in generator room (Room 102), Building E7821
BA-3247_2009-06-18_07.tif	Equipment in transmitter room (Room 101), Building E7821
BA-3247_2009-06-18_08.tif	Antenna coupler building weather shelter, Building E7822, looking south
BA-3247_2009-06-18_09.tif	Overall view of antenna, looking south

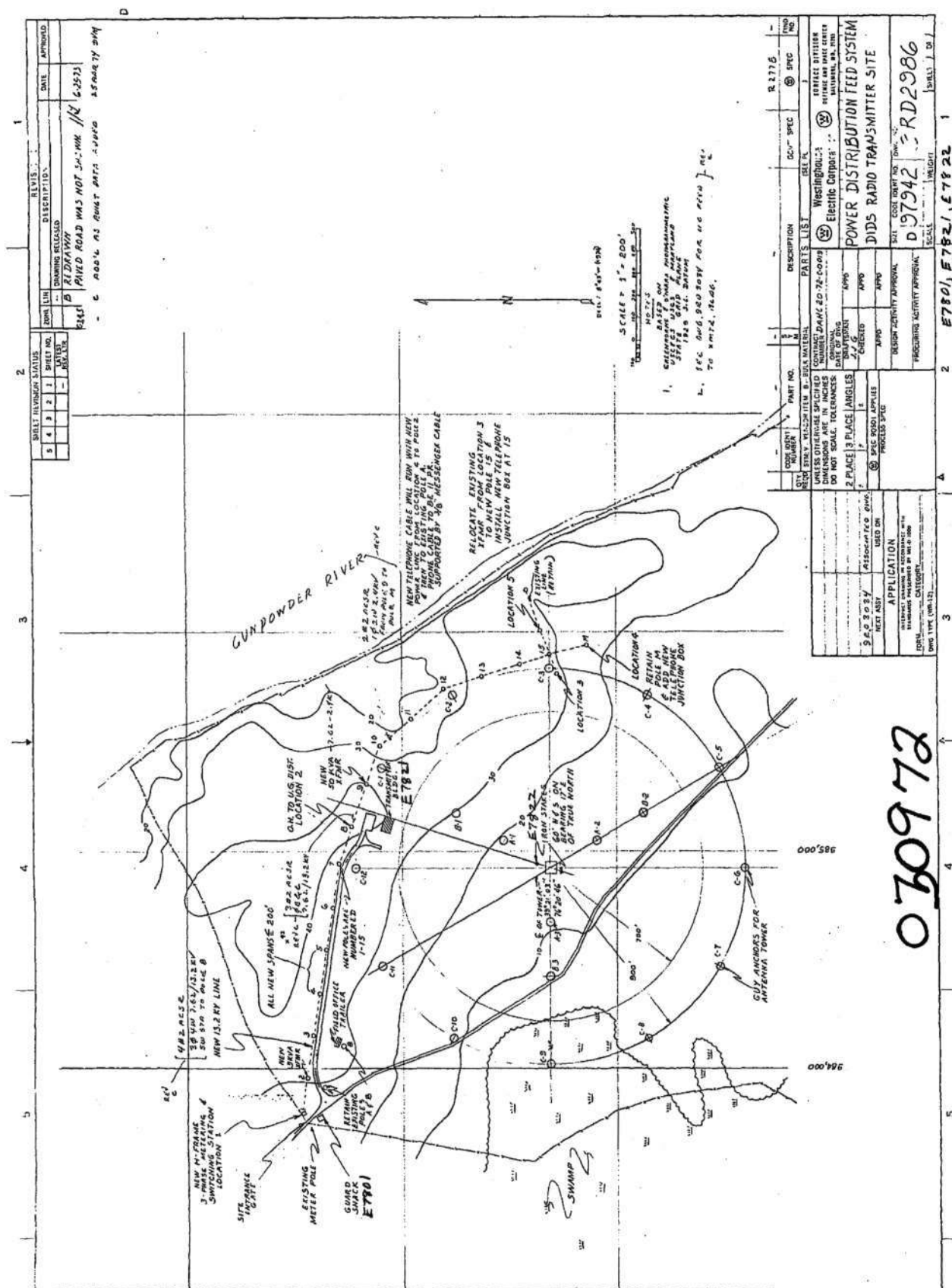
BA-3247

APG, Graces Quarters, Building E7821 (Underground Bunker & Transmitter) and E7822 (Antenna Coupler Building) and Antenna
Chase, Maryland, Baltimore County
System Plan for DIDS

APPENDIX I.



APG, Graces Quarters, Building E7821 (Underground Bunker & Transmitter) and E7822 (Antenn
Coupler Building) and Antenna
Chase, Maryland, Baltimore County
Original Drawing 1



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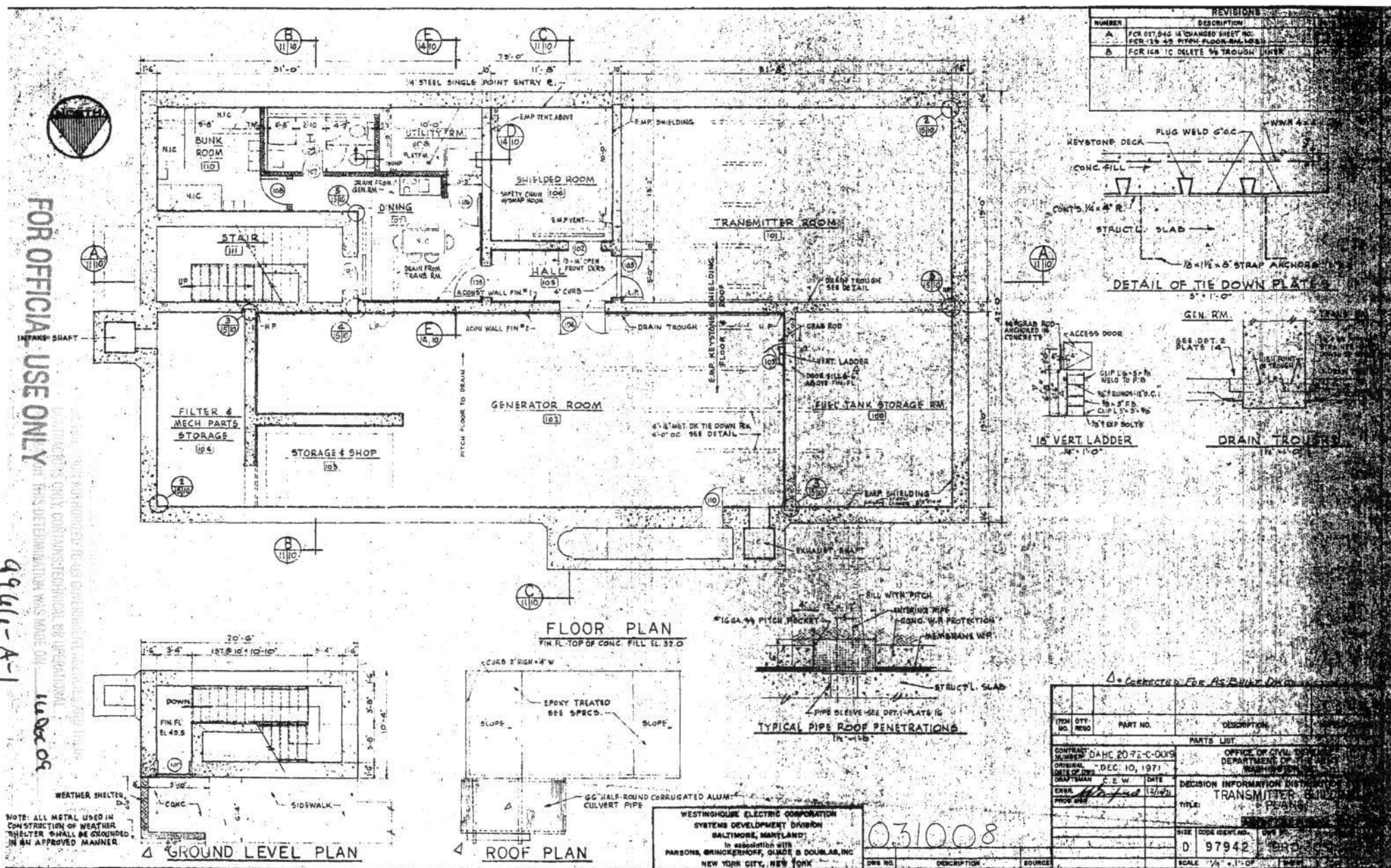
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BA-3247

971 Floor Plan of Building E7821 (Source: APG, DPW, Drawing 031008)

APG, Graces Quarters, Building E7821 (Underground Bunker & Transmitter) and E7822 (Antenna Coupler Building) and Antenna Chase, Maryland, Baltimore County

13 - CORRECTED FOR AIRCRAFT IDENTIFICATION			
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FILED DATE	DEC 10, 1971	DECISION INFORMATION DISTRICT OFFICE TRANSMITTER, 3011 B SECTION 1	
ISSUED DATE	DEC 10, 1971	TITLE:	
FOR		ARCHIVED	
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		D 97942 ORD	
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APG, Graces Quarters, Building E7821 (Underground Bunker & Transmitter) and E7822 (Antenna Coupler Building) and Antenna Chase, Maryland, Baltimore County

971 Section of Building E7821 (Source: APG, DPW, Drawing 031009)

76°22'30"

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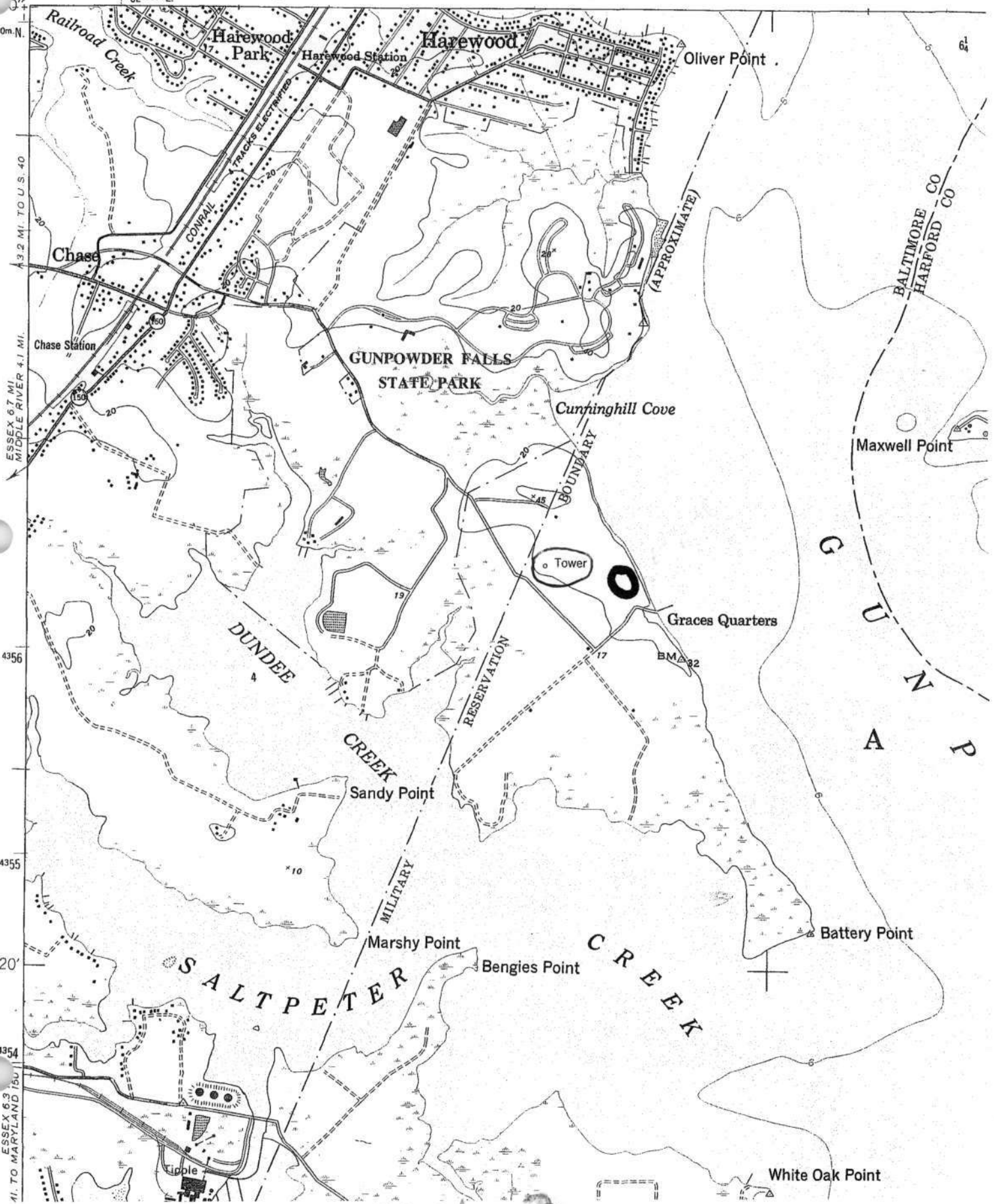
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BA-3247

APG, Graces Quarters, Building E7821 (Underground Bunker & Transmitter) and E7822 (Antenna Coupler Building) and Antenna Chase, Maryland, Baltimore County
USGS Gunpowder Neck quadrangle map
1:24,000



end. 3



MIHP# BA-3247
APG, Bldg E7821
Baltimore Co, MD
APG CRM Staff
6/2009

MD SHPO BA-3247-2009-06-18-01
Looking south
1 of 9



MIHP BA-3247

APC Bldg E7821

Baltimore County, MD

6/2009 APC CRM staff

MD SHPO BA-3247-2009-06-18-02

above-ground weather shelter,
looking south

2 of 9

MAIN ENTRANCE



STATION 4

WG!

MIHP BA-3247.

APG Bldg E7821

Baltimore Co. MD

APG CRM Staff

6/2009

MD SHPO BA-3247_2009-06-18_03

Metal blast door looking west

3 of 9



BA-3247
APC Bldg E7821
Baltimore Co, MD
APC CRM staff

6/2009

HDSHPo BA-3247-2009-06-18-04

Descending Stairwell

4 of 9



STAIR
FIRE EXIT
DOOR BEHIND -

MIHP # BA-3247

Bldg E7821

Baltimore Co. MD

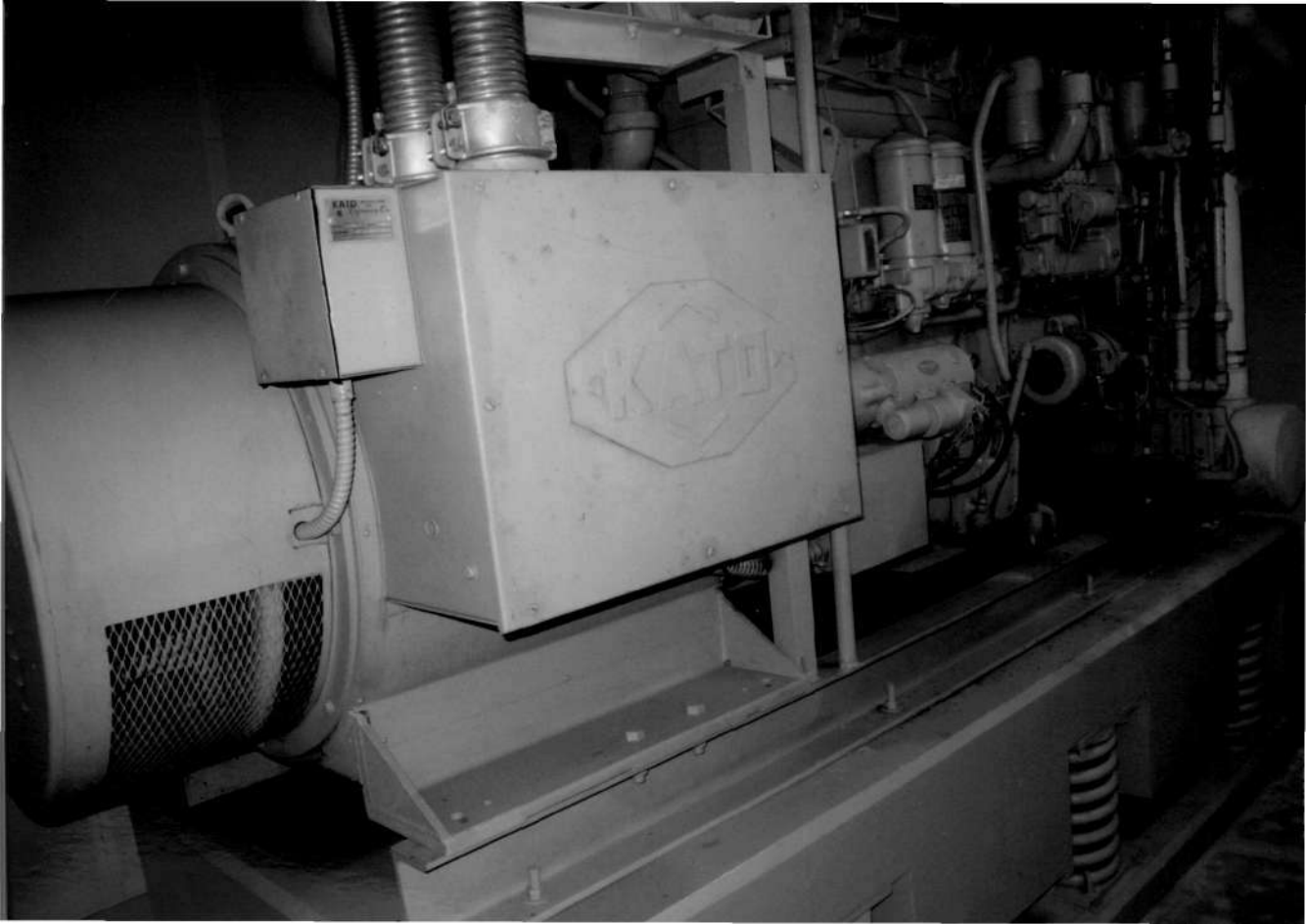
APG CRM Staff

June 2009

MD SHPO BA-3247-200906-18_5

lower entry to Bldg E7821, looking East

5 of 9



MIHP # BA-3247

APG, E7821

Baltimore Co., MD

APG CRH Staff

June 2009

MD SHPO BA-3247-2009-06-18-06

Equipment in generator room

6 of 9



MIHP # BA-3247

APG, E 7821

Baltimore Co. MD

APG CRM staff

6/2009

MD SHPO BA3247-2009-06-18-07

Equipment in transmitter room

7 of 9



MIHP # BA-3247

APG, E7822

Baltimore Co. MD

APG CRH staff

6/2009

MD SHPO BA-3247-2009-06-18-08

Bldg E7822 looking South

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BA- 3247

APG, Antenna near E7821

Baltimore Co. MD

APG CRM Staff

June 2009

MD SHPo BA-3247-2009-06-18_09

Antenna looking South

9 of 9